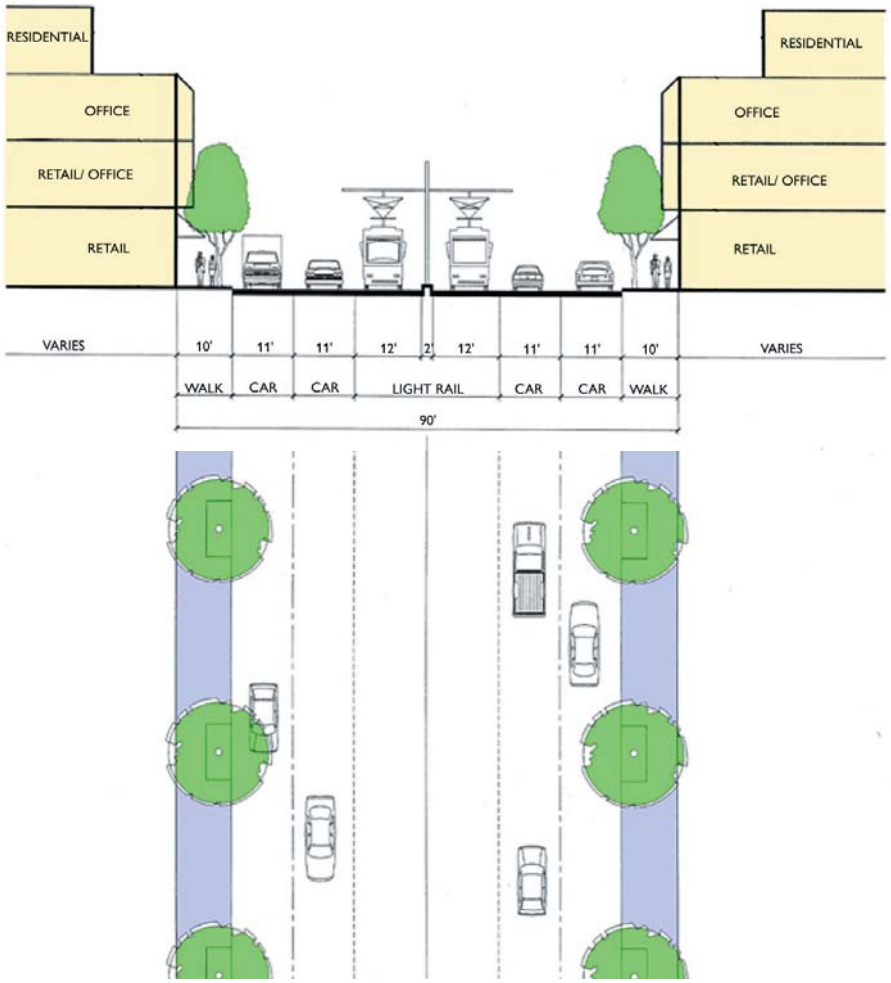
APPENDIX C - NON-PREFERRED STREET SECTION ALTERNATIVES

STREET SECTION & PLAN



Non-Preferred Alternative 1 - Two 12' Light Rail Tracks / Center Pole / Four 11' Travel Lanes / No Parking / 10' Sidewalks

Vehicular

Advantages

- Maintains three travel lanes (two traffic and one light rail) to accommodate peak traffic.
- 11' travel lanes vs. 10' travel lanes could potentially increase traffic capacity by approximately 4%.
- Light rail could play a significant role in reducing vehicular traffic demands.

Disadvantages

- Inability to use a third traffic lane as a travel/turning lane in the peak direction during rush periods.
- Potential growth in the H Street and North Capitol Street corridors may cause a need to keep three traffic lanes in the peak direction during weekday commuter peak periods.

Transit

Advantages

- Ability to maintain local bus service similar to current bus service in addition to light rail.
- Two dedicated lanes each carrying four-car light rail trains with 450 passengers every five minutes has seven-and-a-half times (7.5X) the ridership capacity as conventional bus service with 60-passenger buses at the same interval.[1]
- Because dedicated rights-of-way separate light rail vehicles from other traffic, light rail can operate faster and with greater schedule reliability than local bus service.
- Light rail provides user-friendly service, which enhances access throughout the H Street corridor and also to other key areas in the city.
- Light rail on a dedicated transit lane is generally perceived by the public as a more attractive transit mode than conventional bus service in mixed traffic lanes or even bus rapid transit.[2]

Disadvantages

- Average infrastructure construction capital cost per mile for light rail is $34.8 million vs. $680,000 to $13.5 million for bus rapid transit.[3]
- Light rail vehicle speed is generally slower than that for bus rapid transit.[4]

Pedestrian

Advantages

- Mid-street light rail station platforms provide pedestrian refuge islands.
- Higher quality and more frequent transit service generally translates into more on-street foot-traffic.[5]

Disadvantages

- Elimination of curbside parking lanes eliminates any buffer between the sidewalk pedestrian zone and private vehicle traffic in travel lanes.
- Some sidewalk space is narrower than 10', due to street furniture and bus stops, which does not permit adequate space for pedestrians to walk comfortably on a busy commercial street.
- Two additional 11' travel lanes need to be traversed (since parking lanes would be removed) to reach other side of street, which increases pedestrian/vehicular conflicts.
- Two travel lanes need to be traversed to reach mid-street light rail station platforms.

Parking

Advantages

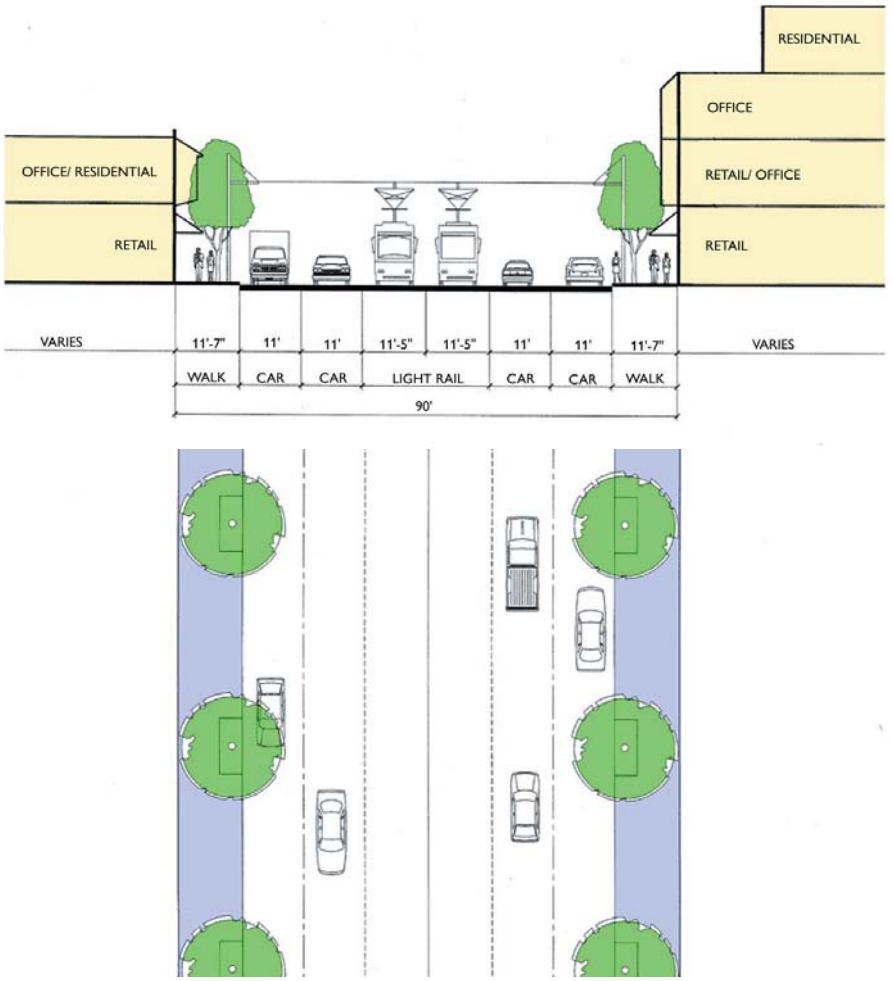
- Light rail could reduce the vehicular parking demands in the corridor with less private vehicle dependency.

Disadvantages

- Permanent curbside travel lanes along H Street eliminate convenient parking spaces.

[1] Valley Connections, *About Light Rail: Fact Sheet*, http://www. valleyconnections.com/images/newsletters/pdf/About_LRT.pdf
[2] McCormick Rankin International, *Bus Rapid Transit, A Creative Solution for Some of Today's Urban Transportation Problems*, November 2000. pp. 18.
[3] United States General Accounting Office, *Bus Rapid Transit Shows Promise*, Washington, DC., 2001. pp. 17.
[4] Ibid. pp. 25.
[5] Arrington, Jr., G.B., *Beyond the Field of Dreams: Light Rail and Growth Management in Portland*, Portland, OR, 1996. pp. 10.

STREET SECTION & PLAN



Non-Preferred Alternative 2 - Light Rail / Two 11'5 inch Tracks / No Center Pole / Four 11' Travel Lanes / 11'7 inch Sidewalks / No Parking

Vehicular

Advantages

- Maintenance of three (3) travel lanes needed (two traffic and one light rail) to accommodate peak traffic demands.
- Light rail could play a significant role in reducing vehicular traffic demands.
- 11' traffic lanes vs. 10' traffic lanes could potentially increase traffic capacity by approximately 4%.

Disadvantages

- Inability to use a third traffic/turning lane as a travel lane in the peak direction during rush periods.
- Potential growth in the H Street and North Capitol Street corridors may cause a need to keep three traffic lanes in the peak direction during weekday commuter peak periods.

Transit

Advantages

- Ability to maintain local bus service similar to current bus service in addition to light rail.
- Two dedicated lanes each carrying four-car light rail trains with 450 passengers every five minutes has seven-and-a-half times (7.5X) the ridership capacity as conventional bus service with 60-passenger buses at the same interval.
- Because dedicated rights-of-way separate light rail vehicles from other traffic, light rail can operate faster and with greater schedule reliability than local bus service.
- Light rail provides user-friendly service that enhances access throughout the H Street corridor and also to other key areas in the city.
- Light rail on a dedicated transit lane is generally perceived by the public as a more attractive transit mode than conventional bus service in mixed traffic lanes.

Disadvantages

- Average infrastructure construction capital cost per mile for light rail is $34.8 million vs. $680,000 to $13.5 million for bus rapid transit.
- Light rail vehicle speed is generally slower than that for bus rapid transit.

Pedestrian

Advantages

- Increase in sidewalk space from 10' to 11'7 inch, provides more pedestrian space on heavily used sidewalks.
- Mid-street light rail station platforms provide pedestrian refuge islands.

Disadvantages

- Removal of curbside parking lanes eliminates any buffer between the sidewalk pedestrian zone and private vehicle traffic in travel lanes.
- Two additional 11' travel lanes need to be traversed to reach other side of street, which increases risk of pedestrian/vehicular conflicts.
- Two travel lanes need to be crossed to reach mid-street light rail station platforms.

Parking

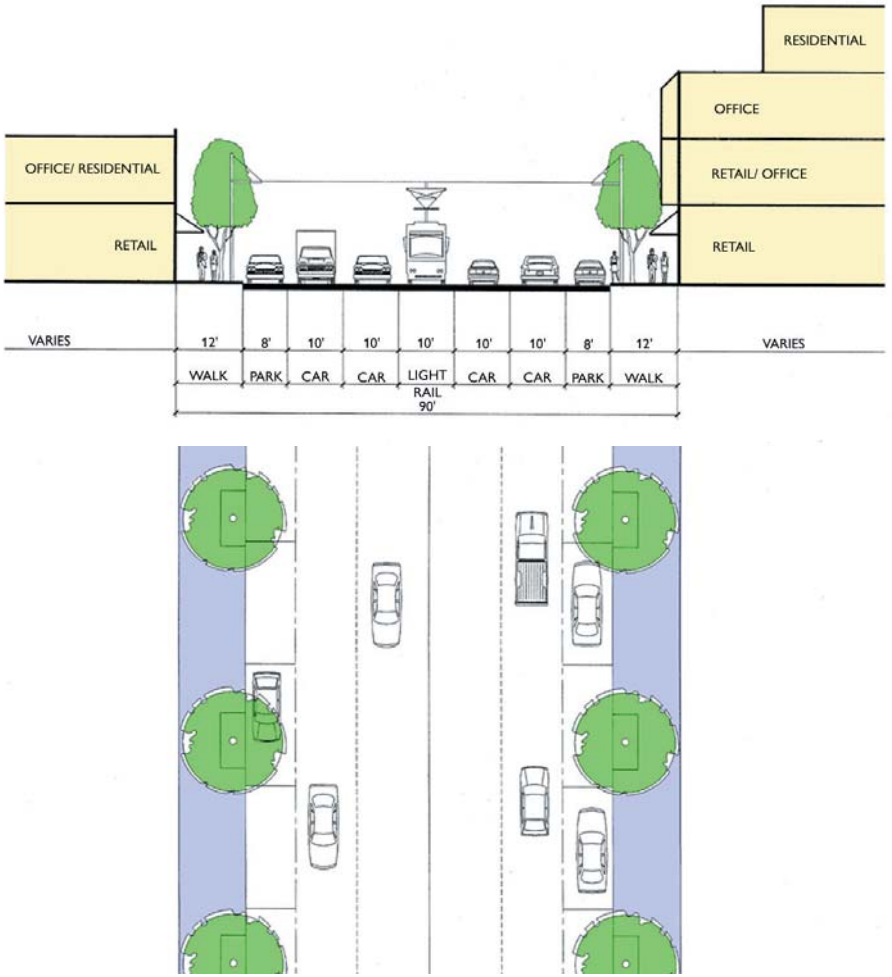
Advantages

- Light rail would reduce the vehicular parking demands in the corridor with less private vehicle dependency.

Disadvantages

- Permanent curbside travel lanes along H Street eliminates convenient parking spaces.

STREET SECTION & PLAN



Non-Preferred Alternative 3 - Light Rail / One 10' Track / Four 10' Travel Lanes / Two 8' Full-Time Parking Lanes / 12' Sidewalks

Vehicular

Advantages

- Maintenance of three (3) travel lanes (two traffic and one light rail) to accommodate peak traffic.
- Light rail would play a significant role in reducing vehicular traffic demands

Disadvantages

- Inability to use a third traffic lane as a travel/turning lane in the peak direction during rush periods.
- Potential growth in H Street and North Capitol Street Corridors are an even greater argument for maintaining three traffic lanes in the peak direction during weekday commuter peak periods.
- Narrowing of travel lanes to 10' from 12'[6] in addition to the synchronized timing of traffic lights would likely slow private vehicle travel speeds.
- Private vehicles entering and exiting curbside parking during peak-time periods in adjacent travel lanes, reduces the capacity of traffic in adjacent travel lanes.

Transit

Advantages

- Ability to maintain local bus service similar to current bus service in addition to light rail.
- One dedicated lane carrying four-car light rail trains with 450 passengers every ten minutes has seven-and-a-half times (7.5X) the ridership capacity as conventional bus service with 60-passenger buses at the same interval.
- Because dedicated rights-of-way separate light rail vehicles from other traffic, light rail can operate faster and with greater schedule reliability than local bus service.
- Light rail provides user-friendly service that enhances access throughout the H Street corridor and also to other key areas in the city.
- Light rail on a dedicated transit lane is generally perceived by the public as a more attractive transit mode than conventional bus service in mixed traffic lanes.

Disadvantages

- 10' travel lanes are narrower than the 11' minimal width considered acceptable for bus turning movements.
- A 10' track would require narrower light rail vehicles than a 12' track (less space in light rail vehicles).
- One dedicated transit lane reduces the frequency and capacity of light rail.
- A disabled light rail vehicle on a single track could significantly cripple light rail service in the corridor.
- Average infrastructure construction capital cost per mile for light rail is $34.8 million vs. $680,000 to $13.5 million for bus rapid transit.
- Light rail vehicle speed is generally slower than that for bus rapid transit.

Pedestrian

Advantages

- Increase in sidewalk space from 10' to 12' provides more pedestrian space on heavily used sidewalks.
- Full-time parking lanes on street provide a protective buffer between the pedestrian and moving traffic zones.
- Permanent curbside parking lanes effectively creates a narrower travel lane zone that must be crossed to reach the other side of the street.
- Private vehicles entering and leaving curbside parking spaces helps slow down private vehicles in adjacent travel lanes.
- 10' travel lanes helps reduce private vehicle driving speeds making for safer pedestrian street crossings.
- Mid-street light rail station platforms provide pedestrian refuge islands.

Disadvantages

- Two travel lanes need to be crossed to reach mid-street light rail station platforms.

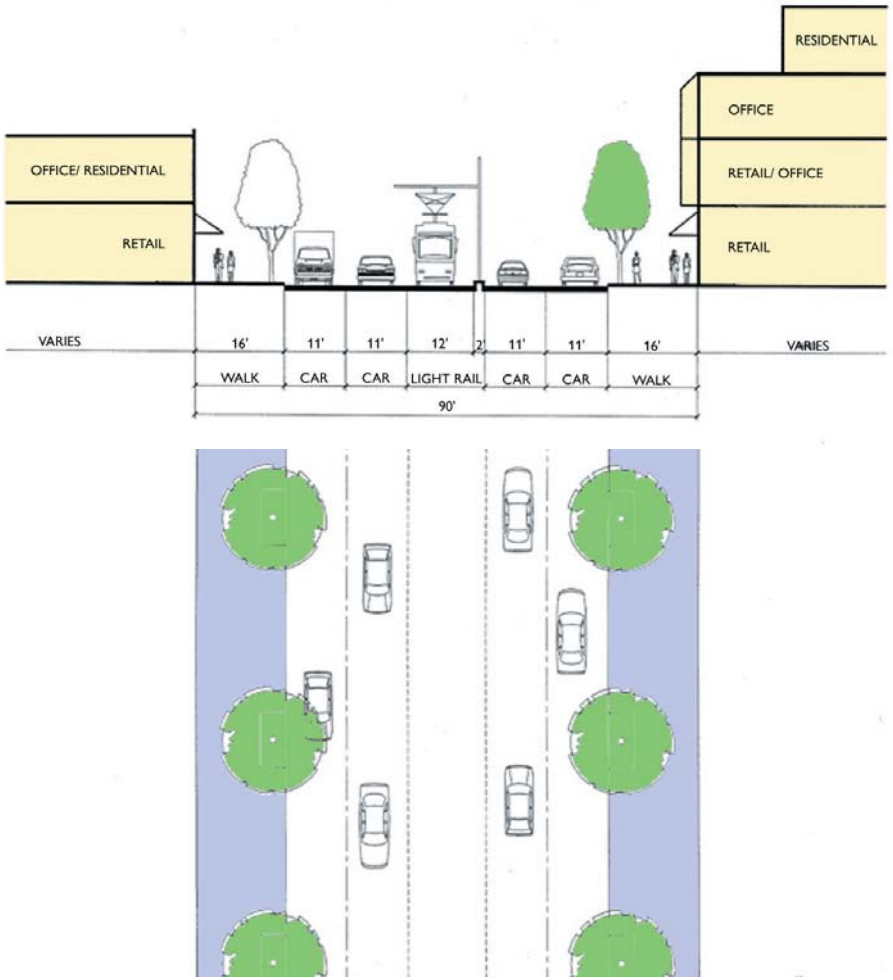
Parking

Advantages

- No parking eliminated within the study area during peak or non-peak times.

[6] Burden, Dan, Building Communities With Transportation, 2001. pp. 9. http://www.walkable.org/trbpaper.pdf

STREET SECTION & PLAN



Non-Preferred Alternative 4 - Light Rail / One 12' Track / Four 11' Travel Lanes / No Parking / 16' Sidewalks

Vehicular

Advantages

- Maintain three travel lanes (two traffic and one light rail) needed to accommodate peak traffic demands.
- Light rail would play a significant role in reducing vehicular traffic demands. 11' travel lanes vs. 10' travel lanes could potentially increase traffic capacity by 4%.

Disadvantages

- Inability to use a third traffic lane as travel/turning lane in the peak direction during rush periods.

Transit

Advantages

- Ability to maintain local bus service similar to current bus service in addition to light rail.
- One dedicated lane carrying four-car light rail trains with 450 passengers every ten minutes has seven-and-a-half times (7.5X) the ridership capacity as conventional bus service with 60-passenger buses at the same interval.
- Because dedicated rights-of-way separate light rail vehicles from other traffic, light rail can operate faster and with greater schedule reliability than local bus service.
- Light rail provides user-friendly service that enhances access throughout the H Street corridor and also to other key areas in the city.
- Light rail on a dedicated transit lane is generally perceived by the public as a more attractive transit mode than conventional bus service in mixed traffic lanes.

Disadvantages

- One dedicated transit lane reduces the frequency and capacity of light rail.
- A disabled light rail vehicle on a single track could significantly cripple light rail service in the corridor.
- Average infrastructure construction capital cost per mile for light rail is $34.8 million vs. $680,000 to $13.5 million for bus rapid transit.
- Light rail vehicle speed is generally slower than that for bus rapid transit.

Pedestrian

Advantages

- Increase in sidewalk space from 10' to 16' provides more pedestrian space on heavily used sidewalks.
- Mid-street light rail station platforms provide pedestrian refuge islands.

Disadvantages

- Elimination of curbside parking lanes eliminates any buffer between the sidewalk pedestrian zone and private vehicle traffic in travel lanes.
- Two additional 11' travel lanes need to be crossed to reach other side of street, increasing the risk of pedestrian/vehicular conflicts.
- Two 11' travel lanes need to be crossed to reach light rail station platforms.

Parking

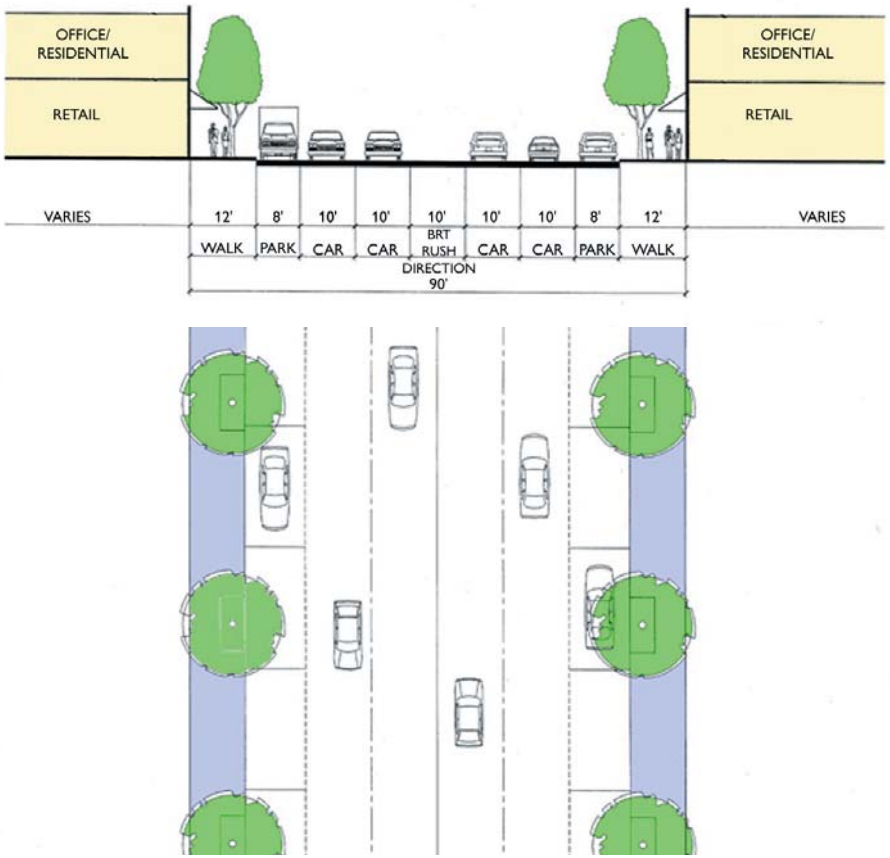
Advantages

- Light rail would reduce the vehicular parking demands in the corridor with less private vehicle dependency.

Disadvantages

- Permanent curbside travel lanes along H Street eliminates convenient parking spaces.

STREET SECTION & PLAN



Non-Preferred Alternative 5 - Bus Rapid Transit / One 10' Center Lane (rush direction) / Four 10' Travel Lanes / Two 8' Full-Time Parking Lanes / 12' Sidewalks

Vehicular

Advantages

- Four to five travel lanes along H Street accommodates heavy traffic volumes during peak and non-peak times.
- Maintains three travel lanes (two traffic and one bus rapid transit) to accommodate peak traffic.
- Bus rapid transit would play a significant role in reducing vehicular traffic demands.

Disadvantages

- Inability to use a third traffic lane as a travel/turning lane for private vehicles in the peak direction during rush periods.
- Narrowing travel lanes to 10' from 12' reduces private vehicle travel speeds.
- Private vehicles entering and exiting curbside parking during peak-time periods in adjacent travel lanes reduces the capacity of traffic in adjacent travel lanes.

Transit

Advantages

- Ability to maintain local bus service similar to current bus service in addition to bus rapid transit.
- One dedicated lane in the peak direction for bus rapid transit increases the ridership capacity of transit.
- Because dedicated rights-of-way separate buses from other traffic, bus rapid transit can operate faster and with greater schedule reliability than local bus service.[7]
- Use of green light signal prioritization, satellite vehicle tracking systems, and real-time bus arrival information at stations, further enhances the schedule reliability of bus rapid transit.
- Bus rapid transit provides user-friendly service that improves access throughout the H Street corridor and also to other key areas in the city.
- Costs for bus rapid transit facilities on dedicated lane are one quarter (1/4) that for facilities using light rail.[8]

Disadvantages

- 10' travel lanes are narrower than the 11' minimal width considered acceptable for bus turning movements.
- 10' dedicated bus rapid transit lane is narrower than the 11' minimal width considered acceptable for bus rapid transit vehicles.
- One dedicated bus lane reduces the frequency and capacity of bus rapid transit.
- Bus rapid transit vehicles are smaller and have less capacity than light rail vehicles.

Pedestrian

Advantages

- Increase in sidewalk space from 10' to 12' provides more pedestrian space on heavily used sidewalks.
- Full-time parking lanes on street provide a protective buffer between the pedestrian and moving traffic zones.
- Permanent curbside parking lanes effectively creates a narrower travel lane zone that must be crossed to reach the other side of the street.
- Private vehicles entering and leaving curbside parking spaces helps slow down private vehicles in adjacent travel lanes.
- 10' travel lanes helps reduce private vehicle driving speeds making for safer pedestrian street crossings.
- Mid-street bus rapid transit station platforms provide pedestrian refuge islands.

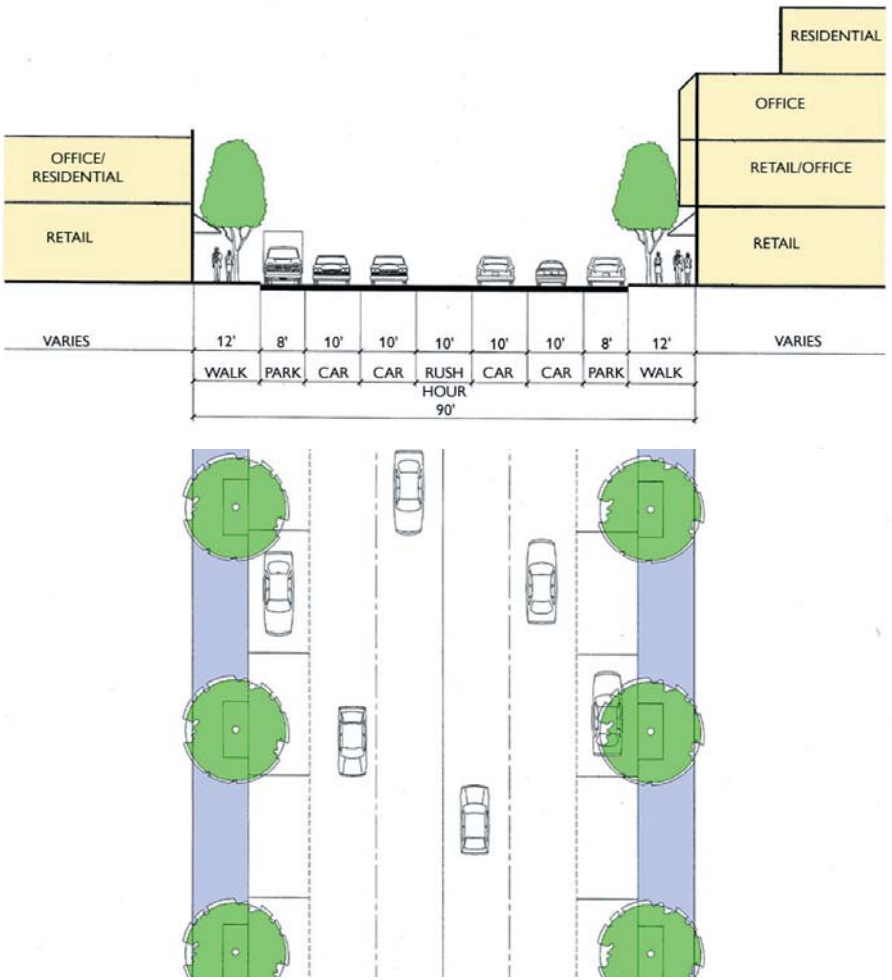
Parking

Advantages

- Parking is added within the study area during peak and non-peak times.

[7] McCormick Rankin International, *Bus Rapid Transit, A Creative Solution for Some of Today's Urban Transportation Problems*, November 2000. pp. 8-10.
[8] United States General Accounting Office, *Bus Rapid Transit Shows Promise*, Washington, DC., 2001. pp. 17.

STREET SECTION & PLAN



Non-Preferred Alternative 6 - Existing with Rush Hour Parking (Four 10' Travel Lanes / One 10' Rush Hour Lane / Two 8' Full-Time Parking Lanes / 12' Sidewalks)

Vehicular

Advantages

- Four to five traffic lanes available all day to handle heavy traffic volumes (24,000 per day).
- Extra travel lanes in the peak direction during rush periods provide the motorist with three lanes in peak direction. Two to three travel lanes are needed to handle this level of traffic with turning movements and frequent bus activity. H Street carries about 1,600 vehicles per hour going at about 25 to 30 miles per hour in the peak direction.
- Potential growth in H Street and North Capitol Street Corridors are an even greater argument for maintaining three traffic lanes in the peak direction during weekday commuter peak periods.

Disadvantages

- Narrowing travel lanes to 10' from 12' slows private vehicle travel speeds.
- Private vehicles entering and exiting curbside parking during peak time periods in adjacent travel lanes reduces the capacity of traffic in adjacent travel lanes.

Transit

Advantages

- Corridor currently well-served by a number of Metrobus lines, which connect H Street to Union Station, Downtown, East of the River, and other key activity nodes and residential areas.
- Compared with light rail or bus rapid transit, infrastructure costs for the present system of Metrobuses in mixed-traffic lanes are small and the vehicles are less expensive to operate.
- Some Metrobuses that serve the corridor provide additional capacity.
- Fairly frequent service along corridor, with buses coming between every 5 and 30 minutes.

Disadvantages

- 10' travel lanes are narrower than the 11' minimal width considered acceptable for bus turning movements.
- Buses operating in mixed traffic lanes are generally slower and have less schedule reliability than vehicles on an exclusive transit lane.
- Older bus models with steps at entrance take longer to board and disembark than generally low-floor light Rail or bus rapid transit cars.

Pedestrian

Advantages

- Increase in sidewalk space from 10' to 12' provides more pedestrian space on heavily used sidewalks.
- Full-time parking lanes on street provide a protective buffer between the pedestrian and moving traffic zones.
- Permanent curbside parking lanes effectively creates a narrower travel lane zone that must be crossed to reach the other side of the street.
- Private vehicles entering and leaving curbside parking spaces helps slow down private vehicles in adjacent travel lanes.
- 10' travel lanes helps reduce private vehicle driving speeds making for safer pedestrian street crossings.

Disadvantages

- An extra travel lane in either direction during peak periods creates an additional 10' of private vehicle travel space that a pedestrian needs to cross, increasing risk of pedestrian/vehicular conflicts.
- No mid-street transit platforms to serve as pedestrian refuge islands.

Parking

Advantages

- No parking eliminated within the study area during peak or non-peak times.